

What Is Claimed Is:

1. An isolated polynucleotide comprising a nucleic acid sequence at least 70% identical to a member selected from the group consisting of:

- 5 (a) a nucleotide sequence encoding amino acid residues 1 to 207 of SEQ ID NO:2;
- (b) a nucleotide sequence encoding amino acid residues 2 to 207 of SEQ ID NO:2;
- (c) a nucleotide sequence encoding amino acid residues 28 to 207 of SEQ ID NO:2;
- (d) a nucleotide sequence encoding amino acid residues 30 to 207 of SEQ ID NO:2;
- (e) a nucleotide sequence encoding amino acid residues 7 to 207 of SEQ ID NO:2;
- 10 (f) a nucleotide sequence encoding the complete polypeptide encoded by the human cDNA contained in clone HKAPI15;
- (g) a nucleotide sequence encoding the complete polypeptide encoded by the human cDNA contained in clone HKAPI15 excepting the N-terminal methionine;
- (h) a nucleotide sequence encoding the mature polypeptide encoded by the human cDNA contained in clone HKAPI15; and
- 15 (i) a nucleotide sequence complementary to any of the nucleotide sequences in (a), (b), (c), (d), (e), (f), (g), or (h) above.

2. An isolated polynucleotide comprising a nucleic acid sequence selected from the group consisting of:

- (a) a nucleotide sequence which encodes a biologically active fragment of amino acid residues 1 to 207 of SEQ ID NO:2; and
- (b) a nucleotide sequence complementary to the nucleotide sequence of (a).

25 3. The nucleic acid molecule of claim 1 wherein said polynucleotide has the nucleotide sequence in Figure 1 (SEQ ID NO:1) encoding the KDI polypeptide having the amino acid sequence in positions 7 to 207 of SEQ ID NO:2.

30 4. The nucleic acid molecule of claim 1 wherein said polynucleotide has the nucleotide sequence in Figure 1 (SEQ ID NO:1) encoding the KDI polypeptide having the amino acid sequence in positions 28 to 207 of SEQ ID NO:2.

35 5. An isolated nucleic acid molecule comprising a polynucleotide having a nucleotide sequence at least 80% identical to a sequence selected from the group consisting of:

- (a) a nucleotide sequence encoding a polypeptide comprising the amino acid sequence of residues n-207 of SEQ ID NO:2, where n is an integer in the range of 1-59;
- (b) a nucleotide sequence encoding a polypeptide comprising the amino acid sequence of residues 1-m of SEQ ID NO:2, where m is an integer in the range of 183-207;
- (c) a nucleotide sequence encoding a polypeptide having the amino acid sequence

consisting of residues n-m of SEQ ID NO:2, where n and m are integers as defined respectively in (a) and (b) above;

5 (d) a nucleotide sequence encoding the polypeptide encoded by the human cDNA in clone HKAPI15 wherein said polypeptide is lacking between 1 and 58 amino acids from its N-terminus;

(e) a nucleotide sequence encoding the polypeptide encoded by the human cDNA in clone HKAPI15 wherein said polypeptide is lacking between 1 and 24 amino acids from its C-terminus; and

10 (f) a nucleotide sequence encoding the polypeptide encoded by the human cDNA in clone HKAPI15 wherein said polypeptide has any combination of N-terminal and C-terminal deletions described in (d) and (e), above.

15 6. An isolated nucleic acid molecule comprising a polynucleotide which hybridizes under stringent hybridization conditions to a polynucleotide having a nucleotide sequence identical to a nucleotide sequence in (a), (b), (c), (d), (e), (f), (g) or (h) of claim 1 wherein said polynucleotide which hybridizes does not hybridize under stringent hybridization conditions to a polynucleotide having a nucleotide sequence consisting of only A residues or of only T residues.

20 7. An isolated nucleic acid molecule comprising a polynucleotide which encodes the amino acid sequence of an epitope-bearing portion of a KDI polypeptide having an amino acid sequence in (a), (b), (c), (d), (e), (f) or (g) of claim 1.

25 8. The isolated nucleic acid molecule of claim 7 comprising a nucleic acid sequence which encodes an epitope-bearing portion of a KDI polypeptide selected from the group consisting of:

30 (a) a polypeptide comprising amino acid residues from about Ser 49 to about Ser 54 in SEQ ID NO:2;

(b) a polypeptide comprising amino acid residues from about Cys 59 to about Ala 65 in SEQ ID NO:2;

(c) a polypeptide comprising amino acid residues from about Pro 78 to about Tyr 88 in SEQ ID NO:2;

(d) a polypeptide comprising amino acid residues from about His 101 to about Gln 113 in SEQ ID NO:2;

35 (e) a polypeptide comprising amino acid residues from about Gln 120 to about Glu 123 in SEQ ID NO:2;

(f) a polypeptide comprising amino acid residues from about Cys 128 to about Pro 155 in SEQ ID NO:2,

(g) a polypeptide comprising amino acid residues from about Leu 160 to about Arg 168 in SEQ ID NO:2;

(h) a polypeptide comprising amino acid residues from about Asn 171 to about Asp 180 in SEQ ID NO:2;

5 (i) a polypeptide comprising amino acid residues from about Val 186 to about Cys 193 in SEQ ID NO:2; and

(j) a polypeptide comprising amino acid residues from Phe 204 to about Lys 207 in SEQ ID NO:2.

10 9. A method for making a recombinant vector comprising inserting an isolated nucleic acid molecule of claim 1 into a vector.

10. A recombinant vector produced by the method of claim 9.

15 11. A method of making a recombinant host cell comprising introducing the recombinant vector of claim 10 into a host cell.

12. A recombinant host cell produced by the method of claim 11.

20 13. A recombinant method for producing a KDI polypeptide, comprising culturing the recombinant host cell of claim 12 under conditions such that said polypeptide is expressed and recovering said polypeptide.

25 14. An isolated KDI polypeptide comprising an amino acid sequence at least 70% identical to a member selected from the group consisting of:

(a) amino acid residues 1 to 207 of SEQ ID NO:2;

(b) amino acid residues 2 to 207 of SEQ ID NO:2;

(c) amino acid residues 28 to 207 of SEQ ID NO:2;

(d) amino acid residues 7 to 207 of SEQ ID NO:2;

30 (e) the complete polypeptide encoded by the human cDNA contained in clone HKAPI15;

(f) the complete polypeptide encoded by the human cDNA contained in clone HKAPI15 excepting the N-terminal methionine; and

(g) the mature polypeptide encoded by the human cDNA contained in clone HKAPI15.

35 15. An isolated polypeptide comprising an epitope-bearing portion of the KDI protein, wherein said portion is selected from the group consisting of:

(a) a polypeptide comprising amino acid residues from about Ser 49 to about Ser 54 in SEQ ID NO:2;

(b) a polypeptide comprising amino acid residues from about Cys 59 to about Ala 65 in SEQ ID NO:2;

(c) a polypeptide comprising amino acid residues from about Pro 78 to about Tyr 88 in SEQ ID NO:2;

5 (d) a polypeptide comprising amino acid residues from about His 101 to about Gln 113 in SEQ ID NO:2;

(e) a polypeptide comprising amino acid residues from about Gln 120 to about Glu 123 in SEQ ID NO:2;

10 (f) a polypeptide comprising amino acid residues from about Cys 128 to about Pro 155 in SEQ ID NO:2,

(g) a polypeptide comprising amino acid residues from about Leu 160 to about Arg 168 in SEQ ID NO:2;

(h) a polypeptide comprising amino acid residues from about Asn 171 to about Asp 180 in SEQ ID NO:2;

15 (i) a polypeptide comprising amino acid residues from about Val 186 to about Cys 193 in SEQ ID NO:2; and

(j) a polypeptide comprising amino acid residues from about Phe 204 to about Lys 207 in SEQ ID NO:2.

20 16. An isolated antibody that binds specifically to a KDI polypeptide of claim 14.

17. An isolated nucleic acid molecule comprising a polynucleotide having a nucleotide sequence which is at least 80% identical at least 50 contiguous nucleotides from SEQ ID NO:1.

25 18. An isolated polypeptide comprising an amino acid sequence of a biologically active fragment of amino acid residues 1 to 207 of SEQ ID NO:2.

30 19. A pharmaceutical composition comprising a polypeptide of claim 14 in a pharmaceutically acceptable carrier.

20. A method of treating viral infection in a patient comprising administering to the patient the composition of claim 19.

35 21. The product produced by the method of claim 13.

22. An agonist of the polypeptide of claim 14.

23. An antagonist of the polypeptide of claim 14.

24. A method for preventing, treating, or ameliorating a medical condition which comprises administering to a mammalian subject a therapeutically effective amount of the polypeptide of claim 14 or of the polynucleotide of claim 1.

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25. A method of diagnosing a pathological condition or a susceptibility to a pathological condition in a subject related to expression or activity of a secreted protein comprising:

10 (a) determining the presence or absence of a mutation in the polynucleotide of claim 1;
and

(b) diagnosing a pathological condition or a susceptibility to a pathological condition based on the presence or absence of said mutation.

15 26. A method of diagnosing a pathological condition or a susceptibility to a pathological condition in a subject related to increased or decreased expression or activity of the polypeptide of claim 14 comprising:

(a) determining the presence or amount of expression or activity of the polypeptide of claim 14 in a biological sample; and

20 (b) diagnosing a pathological condition or a susceptibility to a pathological condition based on the presence or amount of expression or activity of the polypeptide.

25 27. A method for identifying binding partner to the polypeptide of claim 14 comprising:

(a) contacting the polypeptide of claim 14 with a binding partner; and

(b) determining whether the binding partner effects an activity of the polypeptide.

28. The isolated gene corresponding to the cDNA sequence of SEQ ID NO:1.

29. The method of claim 24 wherein said medical condition is selected from the group 30 consisting of: an immune system-related disorder, a viral infection, viral exposure and cancer.

35 30. A method of treating an immune system-related disorder by administering the nucleic acid of claim 1.

31. A method of treating an immune system-related disorder by administering the polypeptide of claim 14.

32. An isolated polynucleotide comprising a nucleic acid sequence at least 70%

identical to a member selected from the group consisting of:

- (a) a nucleotide sequence encoding amino acid residues 27 to 207 of SEQ ID NO:2;
- (b) a nucleotide sequence encoding amino acid residues 23 to 207 of SEQ ID NO:2;
- (c) a nucleotide sequence encoding amino acid residues 24 to 207 of SEQ ID NO:2;
- 5 (d) a nucleotide sequence encoding amino acid residues 28 to 192 of SEQ ID NO:2;
- (e) a nucleotide sequence encoding amino acid residues 30 to 192 of SEQ ID NO:2;
- (f) a nucleotide sequence encoding amino acid residues 30 to 182 of SEQ ID NO:2;
- (g) a nucleotide sequence encoding amino acid residues 28 to 182 of SEQ ID NO:2;
- (h) a nucleotide sequence encoding amino acid residues 168 to 182 of SEQ ID NO:2;
- 10 (i) a nucleotide sequence encoding amino acid residues 28 to 193 of SEQ ID NO:2 in which C193 is altered to S193;
- (j) a nucleotide sequence encoding amino acid residues 30 to 193 of SEQ ID NO:2 in which C193 is altered to S193;
- (k) a nucleotide sequence encoding amino acid residues 30 to 199 of SEQ ID NO:2;
- 15 (l) a nucleotide sequence encoding amino acid residues 30 to 199 of SEQ ID NO:2 in which R192 is altered to K192;
- (m) a nucleotide sequence encoding amino acid residues 30 to 207 of SEQ ID NO:2 in which R192 is altered to K192;
- (n) a nucleotide sequence encoding amino acid residues 38 to 207 of SEQ ID NO:2 in
- 20 which amino acid residues 145 to 156 of SEQ ID NO:2 are removed;
- (o) a nucleotide sequence encoding amino acid residues 28 to 207 of SEQ ID NO:2 in which amino acid residues 146 to 157 of SEQ ID NO:2 are removed;
- (p) a nucleotide sequence encoding amino acid residues 28 to 207 of SEQ ID NO:2 in which amino acid residues 146 to 157 of SEQ ID NO:2 are removed and N145 is altered to
- 25 D145;
- (q) a nucleotide sequence encoding amino acid residues 28 to 207 of SEQ ID NO:2 in which amino acid residues 146 to 157 of SEQ ID NO:2 are removed and N145 is altered to M145;
- (r) a nucleotide sequence encoding amino acid residues 28 to 207 of SEQ ID NO:2 in
- 30 which amino acid C193 is altered to S193;
- (s) a nucleotide sequence encoding amino acid residues 30 to 192 of SEQ ID NO:2 in which R192 is altered to K192;
- (t) a nucleotide sequence of any of the nucleotides sequences in (a), (b), (c), (d), (e),
- (f), (g), (i), (j), (k), (l), (m), (n), (o), (p), (q), or (s), above, in which amino acid C193 is
- 35 altered to S193;
- (u) a nucleotide sequence of any of the nucleotides sequences in (a), (b), (c), (d), (e),
- (f), (g), (i), (j), (k), (l), (m), (n), (o), (p), (q), (r), (s), or (t), above, in which amino acid N63 is altered to R63;
- (v) a nucleotide sequence of any of the nucleotides sequences in (a), (b), (c), (d), (e),

(f), (g), (i), (j), (k), (l), (m), (n), (o), (p), (q), (r), (s), (t), or (u), above, in which amino acid residues 145 to 156 of SEQ ID NO:2 are removed;

5 (w) a nucleotide sequence of any of the nucleotides sequences in (a), (b), (c), (d), (e), (f), (g), (i), (j), (k), (l), (m), (n), (o), (p), (q), (r), (s), (t), or (u), above, in which amino acid residues 146 to 156 of SEQ ID NO:2 are removed;

(x) a nucleotide sequence of any of the nucleotides sequences in (a), (b), (c), (d), (e), (f), (g), (i), (j), (k), (l), (m), (n), (o), (p), (q), (r), (s), (t), or (u), above, in which amino acid residues 146 to 157 of SEQ ID NO:2 are removed; and

10 (y) a nucleotide sequence complementary to any of the nucleotide sequences in (a), (b), (c), (d), (e), (f), (g), (h), (i), (j), (k), (l), (m), (n), (o), (p), (q), (r), (s), (t), (u), (v), (w) or (x), above.

33. A method for making a recombinant vector comprising inserting an isolated nucleic acid molecule of claim 32 into a vector.

15 34. A recombinant vector produced by the method of claim 33.

20 35. A method of making a recombinant host cell comprising introducing the recombinant vector of claim 34 into a host cell.

25 36. A recombinant host cell produced by the method of claim 35.

37. A recombinant method for producing a KDI polypeptide, comprising culturing the recombinant host cell of claim 36 under conditions such that said polypeptide is expressed and recovering said polypeptide.

38. An isolated KDI polypeptide comprising an amino acid sequence at least 80% identical to a member selected from the group consisting of:

- (a) amino acid residues 27 to 207 of SEQ ID NO:2;
- (b) amino acid residues 23 to 207 of SEQ ID NO:2;
- (c) amino acid residues 24 to 207 of SEQ ID NO:2;
- (d) amino acid residues 28 to 192 of SEQ ID NO:2;
- (e) amino acid residues 30 to 192 of SEQ ID NO:2;
- (f) amino acid residues 30 to 182 of SEQ ID NO:2;
- (g) amino acid residues 28 to 182 of SEQ ID NO:2;
- (h) amino acid residues 30 to 192 of SEQ ID NO:2 in which R192 is altered to K192;
- (i) amino acid residues 28 to 193 of SEQ ID NO:2 in which C193 is altered to S193;
- (j) amino acid residues 30 to 193 of SEQ ID NO:2 in which C193 is altered to S193;
- (k) amino acid residues 30 to 199 of SEQ ID NO:2;

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- (l) amino acid residues 30 to 199 of SEQ ID NO:2 in which R192 is altered to K192;
- (m) amino acid residues 30 to 207 of SEQ ID NO:2 in which R192 is altered to K192;
- (n) amino acid residues 38 to 207 of SEQ ID NO:2 in which amino acid residues 145 to 156 of SEQ ID NO:2 are removed;
- 5 (o) amino acid residues 28 to 207 of SEQ ID NO:2 in which amino acid residues 146 to 157 of SEQ ID NO:2 are removed;
- (p) amino acid residues 28 to 207 of SEQ ID NO:2 in which amino acid residues 146 to 157 of SEQ ID NO:2 are removed and N145 is altered to D145;
- (q) amino acid residues 28 to 207 of SEQ ID NO:2 in which amino acid residues 146 to 10 157 of SEQ ID NO:2 are removed and N145 is altered to M145;
- (r) amino acid residues 28 to 207 of SEQ ID NO:2 in which amino acid C193 is altered to S193;
- (s) any of the amino acid sequences in (a), (b), (c), (d), (e), (f), (g), (h), (k), (l), (m), (n), (o), (p), or (q), above, in which amino acid C193 is altered to S193;
- 15 (t) any of the amino acid sequences in (a), (b), (c), (d), (e), (f), (g), (h), (i), (j), (k), (l), (m), (n), (o), (p), (q), or (r) above, in which amino acid N63 is altered to R63;
- (u) any of the amino acid sequences in (a), (b), (c), (d), (e), (f), (g), (h), (i), (j), (k), (l), (m), (r), (s), or (t) above, in which amino acid residues 145 to 156 of SEQ ID NO:2 are removed;
- 20 (v) any of the amino acid sequences in (a), (b), (c), (d), (e), (f), (g), (h), (i), (j), (k), (l), (m), (r), (s) or (t) above, in which amino acid residues 146 to 156 of SEQ ID NO:2 are removed;
- (w) any of the nucleotides sequences in (a), (b), (c), (d), (e), (f), (g), (i), (j), (k), (l), (m), (r), (s), (t), or (u), above, in which amino acid residues 146 to 157 of SEQ ID NO:2 are removed; and
- 25 (x) amino acid residues 168 to 182 of SEQ ID NO:2.

39. The method of claim 24, wherein said medical condition is selected from the group consisting of: viral infection and viral exposure.

30 40. The polynucleotide of claim 1, wherein said nucleic acid sequence is the codon optimized nucleic acid sequence of SEQ ID NO:22.

add 27